AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings include changes to FIGS. 52-54.

Attachment: Replacement sheet

REMARKS

Claims 1-61 are now of record in the application, claims 5-11, 13, 14, 17-21 and 24-59 having been withdrawn from further consideration as being drawn to a non-elected species. The amendments to the claims contained herein are of equivalent scope as originally filed and, thus, are not a narrowing amendment. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

ELECTION/RESTRICTIONS

The Applicants believe that Claims 60 and 61 are generic as stated in the response to the Election and/or Restriction Requirement, and Claims 60 and 61 should be allowable due to reasons described below. Therefore, contrary to the assertion by the Examiner, it is respectfully urged that these claims are allowable or linking claims.

DRAWINGS

The drawings stand objected to for certain informalities. Applicants have attached revised drawings for the Examiner's approval. In the "Replacement Sheets" the legend "Prior Art" has been added to FIGS. 52-54.

CLAIM OBJECTIONS

Claims 3 and 4 were objected to based on certain wording informalities. Applicants' have amended claim 3 and 4 to correct these informalities. Specifically the claims have been amended to recite "principal state of polarization (PSP)." In this regard, applicants wish to note that "principal" and not "principle" has been used to conform to standard American English spelling rules.

REJECTION UNDER 35 U.S.C. § 112

Claim 2 stands rejected under 35 U.S.C. § 112, first paragraph, as purportedly failing to comply with the written description requirement. This rejection is respectfully traversed.

Contrary to the assertion by the Examiner, the limitation pointed out by the Examiner is disclosed in, for example FIGs. 21-23 and 25 in which a polarization separator (140 or 150) and an optical divider (141 or 151) are provided, and their relevant description in the specification. Since these figures are in reality drawn to a non-elected species, it appears to the Applicants that these figures were overlooked by the Examiner.

Claim 4 also includes a limitation similar to the foregoing limitation of Claim 2, and such a limitation is also supported by, for example, FIGs. 21-23 and 25 and their relevant description in the specification.

In view of the assertion by the Examiner, Claims 2-4 have been amended. Specifically, in Claim 2, "said one polarization component which has thus been separated" has been replaced with "either one of the polarization component which is parallel to the principal state of polarization of said optical transmission path or the polarization component which is perpendicular to the principal state of polarization of said optical transmission path, which has thus been separated". Moreover, in Claims 3 and 4, polarization components should be separated rather than the PSP as recited in original Claims 3 and 4. Accordingly, such an error has been corrected.

REJECTION UNDER 35 U.S.C. § 102

Claims 1, 2, 60 and 61 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Admitted Prior Art ("APA"). This rejection is respectfully traversed.

The Applicant believes that the invention as recited in independent Claims 1-4, 12, 15, 60 and 61 is distinguishable from APA, Hideaki and Penninckx.

Please note that Hideaki is mentioned in the description of APA as "Japanese Patent Laying Open Publication 2000-356760". Therefore arguments to one of Hideaki and APA can apply to the other of Hideaki and APA.

Although problems caused by APA are explained in the description of APA, it appears that the Examiner may have overlooked this description.

With respect to Claims 1 and 2, the Examiner points out FIG. 53 and page 2, line 18 to page 3, line 13 of the specification (i.e., "prior art 2"). However, prior art 2 causes problems as explained on page 3, fourth and fifth paragraphs of the specification. Nevertheless, these problems can be solved by prior art 3 as explained on page 4, first paragraph of the specification.

With respect to Claims 60 and 61, the Examiner points out FIG. 54 and page 4, line 1 to page 5, line 7 of the specification (i.e., "prior art 3"). However, prior art 3 causes problems as explained on page 6, second to fourth paragraphs of the specification.

Specifically, since the propagation delays of optical signals for respective polarization components are different from each other due to the differential groups delay ("DGD"), it is not possible to avoid generation of errors when changing over an optical switch 423. Moreover, problems also arise in that the number of components which are required for manufacture of a polarization mode dispersion compensation device as a whole becomes greatly increased, and in that its control also becomes complicated. Furthermore, although a beneficial effect can be obtained with regard to transmission quality deterioration due to first order PMD, it is not possible to compensate for transmission quality deterioration due to higher order PMD, that is, change of the DGD value which is dependent upon the wavelength, and change of the PSP dependent upon the wavelength. Along with an increase in the bit rate of optical transmission systems, the optical spectrum width of optical signals broadens, and it becomes impossible to ignore changes in the DGD value and in the PSP within the signal waveband. Therefore, with an

ultra-high-speed optical transmission system, it is not only necessary to compensate for first order PMD, but for higher order PMD as well.

However, APA merely compensates the DGD as explained on page 5, last paragraph, lines 1-2 of the specification. The DGD is not a higher order PMD but a first order PMD (page 1, penultimate paragraph, last two lines of the specification).

In contrast, in accordance with the present invention, the compensation for the first order PMD is completed by separating one of, or both of, a polarization component parallel to the PSP of an optical transmission path; and a polarization component perpendicular to the PSP of the optical transmission path, from an optical signal propagated along the optical transmission path. Subsequently, the group velocity dispersion, which is also known as wavelength dispersion or chromatic dispersion that represents the dependency of delay with regard to wavelength, at the separated polarization component or one of the separated polarization components is compensated, thereby compensating the wavelength dispersion and a polarization-dependent chromatic dispersion ("PCD"), which are second order PMD.

In connection with the above matters, the following are disclosed in the embodiments of the present invention:

- By controlling a polarization controller 1 so that a polarizer 2 separates out the polarization component which is parallel to or perpendicular to the principal state of polarization of an optical transmission path 6, it becomes possible to separate out only the optical signal component which has arrived by propagation along the principal state of polarization of the optical transmission path 6, and transmission quality deterioration due to DGD (i.e., a first order PMD) can be compensated for (page 38, second paragraph of the specification).

- Focusing only on one of the two principal states of polarization which are orthogonal to one another, the effect of change (PCD) dependent upon the DGD

wavelength becomes equivalent to group velocity dispersion. Therefore, it is possible simultaneously to implement PCD compensation by compensating the group velocity dispersion (page 38, third paragraph of the specification).

With respect to Claims 3, 4 and 12, the Examiner points out various elements in FIG. 1 and paragraphs 0027-0030 of Hideaki. However, even when referring to such disclosure, Hideaki makes no mention of the compensation of group velocity dispersion.

As has been described in detail, the foregoing distinctive features of the present invention and the advantages obtained therefrom are neither taught nor suggested by APA and Hideaki. Therefore, the present invention would not have been anticipated from APA and Hideaki.

REJECTION UNDER 35 U.S.C. § 103

Claims 15 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hideaki (Japanese Patent Application No. 2000-356760) in view of Penninckx et al. (U.S. Pat. No. 2002-0003916). This rejection is respectfully traversed.

Similar to the assertions for Claims 3, 4 and 12, the Examiner merely points out various elements in FIG. 1 and paragraphs 0027-0030 of Hideaki. Therefore, with respect to the assertions based on Hideaki, the foregoing arguments can apply to Claim 15.

The Examiner also asserts that Hideaki does not disclose a DGD element which allocates a PMD to the optical signal which is outputted from said polarization controller. Penninckx teaches a PMD compensator where a DGD generator is used after a polarization controller (FIG. 1 and paragraph 0018)".

However, Penninckx merely compensates the DGD, which is a first order PMD as described above. The technical ideas of Penninckx are substantially identical to those of Hideaki, and thus Penninckx cannot remedy the deficiencies of Hideaki. Therefore, even if

Penninckx were combined with Hideaki, the present invention would not have been obvious from such a contamination.

Contrary to the assertion by the Examiner, Claim 3 differs from Claim 4.

Specifically, Claim 3 separates the polarization component which is parallel to, or the polarization component which is perpendicular to, the PSP of the optical transmission path and the PMD medium. In contrast, Claim 4 separates the polarization component which is parallel to, and the polarization component which is perpendicular to, the PSP of the optical transmission path and the PMD medium. The Examiner has overlooked such a difference.

Please note that differences between Claims 3 and 4 should be similar to those between Claims 1 and 2. In addition to the above differences between Claims 3 and 4, Claims 1 and 2 also differ in the recitation relating to the compensation of the group velocity dispersion. However, with respect to the compensation of the group velocity dispersion, the recitation of Claim 3 is the same as that of Claim 4. Therefore, Claim 4 has been amended so that differences between Claims 3 and 4 are similar to those between Claims 1 and 2.

ALLOWABLE SUBJECT MATTER

The Examiner states that claims 22 and 23 would be allowable if rewritten in independent form. Accordingly, Applicants have amended claims 22 and 23 so as not to be dependent on withdrawn Claims 13 and 17.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the

present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-0750, under Order No. 5259-000030/US/01 from which the undersigned is authorized to draw.

Dated: May 11, 2007

Respectfully submitted,

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Attachments